1:Vaillant A-5 (1928-1936)1941 NU7 Aztec NU7

435 burdened down with gold, drowned ignominiously in the canals. Diaz, however, noted Indian usage and confined himself to four jades which he was able to exchange later and which, in his words, "served me well in healing my wounds and gathering me food."[10]

648 181 The Aztecs did not have our modern esteem for gold, so the Spaniards had great difficulty in getting it at first. The Mexican Indians responded to the invaders' demands for objects of value by offering jade and turquoise, those substances most precious to themselves. Such misguided compliance was highly irritating to Cortes and his men, who had no ethnological training; nor, it is only fair to say, would they have wanted such education, were it available. Gold [325] was valuable to the Aztecs only for the ornaments which could be made from it, and silver may have had an even greater value, since nodules were rare and the Indians had no technique for smelting the ore.[11] (See Plates 46–47.)

262 24 Thus the Aztecs did not hold our ideas of value and wealth. Yet they contributed much to our prosperity and [567 well-being, partly through being forced as slaves to work 466] the gold and silver mines, whose modern economic significance they so little understood, and even more through the enrichment of the world's supply of foods. In addition to corn of several varieties, the Aztecs developed many sorts of beans, a very nutritive addition to human diet because of the high protein content. Squash, gourds, *chia*, *camotes*, green and red peppers, alligator pears and tomatoes were products of the versatile Middle American farmer, enriching the Aztec diet and that of the modern world. Trade with [137] southern Vera Cruz brought chocolate, vanilla and pineapples to the Aztec larder.[12]

1:Vaillant A-5 (1928-1936)1941 NU7 Aztec NU7

ing of the arm thereby giving the missile an increased propulsive force. Some of these *atl-atls* were most delicately carved and represent the best of Aztec design. (See Plate 54, bottom.)

Metallurgy was in its infancy. Copper was cold-hammered; the art of adding alloys to make bronze had not reached Mexico from the south, but the gilding of copper and mixing of gold and copper were adopted by Mexican goldsmiths. Copper was cast into bells and ornaments, and the process, used also for gold, was the cire-perdue, or lost-wax, method. The desired shape was modeled in clay, over which was dusted finely ground charcoal, followed by an even layer of wax. This coating was also dusted with charcoal and the whole enclosed in clay, which was perforated at the top and bottom. The molten metal was poured in at the upper hole after the wax was melted and the lower orifice plugged. When the metal cooled the cast was broken and the finished object removed.[11] (See Plates 46–47.)

Although most of the native goldwork found its way to the Spanish melting pot, a few lovely ornaments survived; in 1932 the quantity was more than doubled by Dr Alfonso Caso's discovery of the undisturbed tomb of a high Mixtec official. The design and shape of these necklaces, earplugs and rings, by their sheer intricacy and bulk, make one realize that the Spanish descriptions of Cortes' loot understated the rich ability of the Aztec goldsmiths.[12]

Metalworking, without much question, had its origin in Ecuador or Peru, and various techniques were transmitted up the Pacific coast to Panama and Costa Rica, where important goldworking industries were founded. Although the intervening area produced little metal, another center was

1:Vaillant A-5 (1928-1936)1941 NU7 Aztec NU7

325 174 established in Oaxaca in Mixtec times. The Oaxacan ornaments, although deficient in some of the southern technical developments, surpass in design and workmanship the best of the older goldwork of Peru and Ecuador.[12]

Metallurgy seems to have arrived late in Mexico, certainly not before the eleventh century. Mentions of copper in Toltec times refer more probably to the Dynastic Period than to that of Teotihuacan. I know of neither copper nor gold which comes from the early or middle periods of the great Middle American civilizations, although some hollow clay bells from the late Toltec occupation of Azcapotzalco tantalizingly suggest metal prototypes. Toward the close of the Independent Civilization phase, and more especially during the domination of Mixteca-Puebla culture, there are consistant occurrences of metal objects.

316 Mining methods were rudimentary. Gold was collected in nugget form or panned as dust; copper also was mined as nodules or nuggets; silver, which seldom occurs pure in nature, was for this reason rarely converted into ornaments. The melting furnaces were heated with charcoal and their draft forced by a man blowing on the embers through a tube. The casting we have already described. This work in gold, one of the great wonders of the Conquest, was achieved by the same simple methods of all Aztec handiwork and was another triumph of sheer skill, unassisted by technical aids.

323 Pottery making was the greatest New World craft, and probably no other continent has such a complex range of form and design. The malleability of clay made it easy to work, and firing was simple, so that pottery products were an important part of Indian craftsmanship. In the Valley of Mexico we have no trace of people before the introduction

8: Barlow E-4 (no date)1949 NU7 Aztec NU7

651
[301
314
323
325]

OTHER GOODS

5 strings of *chalchiuites*[a]
8,000 pellets of unrefined copal and burners (quarterly)
400 baskets of refined copal (quarterly)
1,200 yellow-colored clay vessels (quarterly)
100 little copper hatchets (quarterly)

651 *Tribute of the component towns.*—Some idea of the way in which this burden was shared may be gathered from the following details. 632

Alahuiztlan "davan de trebuto mantas, maiz, chian."[b]

Cueçalan gave chalchiuites annually (the string listed above?), besides mantles and other things.[c]

Chilapan gave maize, chile, and animals important for religious reasons (ocelots and eagles).[d]

Otlatlan gave cotton mantles, delivering them directly to Mexico,[e] instead of to a local depot.

Oztoma, being obliged to support the local Mexican garrison, seems to have given nothing more.

Teloloapan gave clothing of various sorts and a mineral dyestuff [386] called "tlalcozahuitl."[f]

Tepequacuilco—as might be expected of the eponymous town—was the presidio from which most of this tribute was gathered.[g] In colonial times, Tepequacuilco became a famous mining center, and indeed, it lost its importance only when the railroad reached Iguala.

Totoltepec is said to have been another nontributary, like Oztoma, because of the garrison, but it still thought it expedient to send its overlords "gifts" of mantles, chalchiuites, and copper.[h]

[a] *PNE*, 6: 102.

[b] "Cada vn año vna esmeralda berde que llaman ellos chalchihuitl, dauanle mantas y otras cosas que tenyan" (*PNE*, 6: 140).

[c] "A Motecçuma ... le servia de llevalle algunos tigres y aguilas, algun mahiz y chile en recognocimiento" (*PNE*, 5: 178). Eagles were the sole tribute of the northern frontier province of Oxitipan.

[d] "Era de Moteçuma ... y le trebutavan mantas de algodon, y ellos mysmos se las llevavan a Mexico" (*PNE*, 6: 128).

[e] "Trebutavan ... mantas y guaipiles y naguas y mantillas delgadas, y tlalcozahuitl que es una arenilla para hazer color amarilla, y otros colores, las quales buscaban para llevar a Mexico con el tributo, por sus tercios" (*PNE*, 6: 146).

[f] "Tenian los señores de Mexico en este pueblo en tiempo de su gentilidad presidio de gente de guarnicion que cobravan los tributos: y recojian de toda la cuisca que eran mantas y algodon y otras cosas" (*Relación de Iguala* [1931], p. 223).

[g] "No llevava trebuto por questavan en frontera con los de Mechoacan y sustentaban los soldados que alli tenian, mexicanos, y en el fuerte de Oztuma, y ... algunas veces del año embiaban presente a mexico de mantas y piedras verdes y 'hierro colorado' que ubia" (*PNE*, 6: 149).

11:Diaz T,H-5 (1519-1520) 1910
NU7 Aztec NU7

 443

off the stone itself; and the fisherwomen and others who [324 262] sell some small cakes made from a sort of ooze which they get out of the great lake, which curdles, and from this they make a bread having a flavour something like cheese. There are for sale axes of brass and copper and tin, and [325 415] gourds and gaily painted jars made of wood. I could wish that I had finished telling of all the things which are sold there, but they are so numerous and of such different quality and the great market place with its surrounding arcades was so crowded with people, that one would not have been able to see and inquire about it all in two days.

Then we went to the great Cue, and when we were 436 already approaching its great courts, before leaving the [443] market place itself, there were many more merchants, who, as I was told, brought gold for sale in grains, just as it is taken from the mines. The gold is placed in thin quills of the geese of the country, white quills, so that the gold can be seen through, and according to the length and thickness of the quills they arrange their accounts with one another, how much so many mantles or so many gourds full of cacao were worth, or how many slaves, or whatever other thing they were exchanging.

Now let us leave the great market place, and not look 346 at it again, and arrive at the great courts and walls where the great Cue stands. Before reaching the great Cue there is a great enclosure of courts, it seems to me larger than the plaza of Salamanca, with two walls of masonry surrounding it and the court itself all paved with very smooth great white flagstones. And where there were not these [364] stones it was cemented and burnished and all very clean, so that one could not find any dust or a straw in the whole place.

When we arrived near the great Cue and before we had ascended a single step of it, the Great Montezuma sent

13: Phillips U-4 (no date) 1925
NU7 Aztec NU7

THE METAL INDUSTRY OF THE AZTECS

By GEORGE BRINTON PHILLIPS

I

121 ●325 THE collections of many thousand copper objects, tools, weapons, and ornaments from ancient Indian burial mounds and village sites in the Unites States of North America is strong evidence in favor of a pre-Columbian copper industry with which the aborigines were familiar before they reached the Iron Age. Did this knowledge and use of copper extend into Mexico and adjacent country of Central America?

325 Prescott in his *Conquest of Mexico* gives a picturesque account of the splendors of the court of the Montezumas with its silver and gold ornaments and utensils, but the knowledge of metals does not seem to have extended to the general use of copper or bronze for tools and weapons. The Aztec in the production of ornaments in the precious metal showed great skill and artistic workmanship and specimens sent over to Spain were greatly [412] admired by the Spanish goldsmiths. Owing to scarcity of copper in their immediate vicinity, the ancient Mexicans confined its use to adze blades, chisels and some copper objects, possibly ceremonial implements. The tools were hardened by hammering and used in wood carving. The stone cutting it is believed was still done with flint tools.

317 325 Copper was obtained from the mines of Zocotallan where it occurred in masses on the surface and also from the galleries opened in the rock. Ancient workings have been discovered at Cerro del Aguilar in Guerrero, and the Zapotec country was well known for its copper mines. Deposits of tin were also found in Guerrero at the mines of Tasco, and it is said that Cortez obtained enough tin from that source with the copper to cast several large cannon, which he used in his fortress at the siege of Mexico. This use of tin in making a suitable alloy it is believed was due to the familiarity the Spaniards had of bronze, rather than to Aztec knowledge of the art.

13: Phillips U-4 (no date) 1925

NU7 Aztec NU7
Tarasco N434
Zapotec N447

The Aztec people had, however, some knowledge of metallurgy, for they melted the copper and cast it in moulds, an art which the aborigines in the United States never seem to have acquired. Cortez tells us that in the markets of the City of Mexico

> "hatchets were sold made of copper alloyed with tin and that this alloy was used with a silicious powder with which they cut the hardest stones."

The Spanish historians speak of Cholula, a very ancient City of Mexico, founded before the arrival of the Aztec, which excelled in metal working, and that the Tarascans living west of the valley of Mexico were familiar with copper found in the mountains in that district, which they worked into defensive armor, body plates of wood covered with sheet copper. They also state that the Zapotec made ornaments of copper obtained from the mines in Oaxaca.

Copper implements, however, were not common near the City of Mexico but were plentiful in Oaxaca, Michoacan, and the Jalisco region. The T-shaped implements were found at Mitla, Central America, being abundant in the Zapotec country. The objects, some made of very thin sheet copper, others heavier, possibly cast, are of uncertain use; those too thin to be used as tools for wood or stone, are thought to be instruments used in their feather work or pottery, others regard them as a money currency or exacted as tribute paid to the City of Mexico by the neighboring cities, this latter being the general opinion.

The number as well as the variety of copper objects from Mexico found in our Museum collections, is rather limited, consisting of a few copper ax heads, chisels, large and small, little bells, finger rings, beads and pins. The peculiar T-shaped objects are the most abundant, differing somewhat in shape and size. An analysis of one of them in the Peabody Museum at Cambridge, proved it to be simply copper. It was doubtful if the ancient Aztec had a knowledge of bronze or knew how to obtain it until shown by the Spanish invaders, and such analyses of Mexican metal objects, giving a percent of tin to indicate a true bronze, may have been implements made after the instruction by the Spaniards. Some copper tools from Mexico when analyzed showed a small amount of tin believed to have been an impurity in the

13: Phillips U-4 (no date) 1925
NU7 Aztec NU7

325 copper ore. A chisel reported in the "Anales del Museo de Mexico" quoted by Sir John Evans, in his *Ancient Mexican Implements* when analyzed gave copper 97.87%, tin 2.13%, not sufficient to make a true bronze. Copper axes from Oaxaca, some heavy metal, apparently cast in a mould, others thin, shaped from sheet copper, have been analyzed and yielded only copper, showing they were *not* bronze.

A recent analysis was made for the writer of a portion of a metal chisel of Aztec origin from the village of Acatlan, in the State of Guerrero, Mexico. It was doubtless authentic being sent by Dr. Manuel Gamio, Direccion Anthropologia, Mexico, for analysis, which was made by Dr. D. L. Wallace of the University of Pennsylvania, Analytical Department. The piece of metal apparently broken from the middle of the chisel weighed 88 gms. It was 30 mm. long, 20 mm. wide and 15 mm. thick. It had a brown patina of oxidation, gave clean metal borings (used in the analysis) of dark red bronze color, and had the appearance of having been cast in an open mould. The specific gravity of the metal was 8.00 compared with Lake Superior native copper 7.50. The analyses yielded results as follows:

Copper	91.40%
Tin	3.07%
Lead	0.82%
Iron	0.53%
Cobalt	0.09%
Sulphur	0.82%
	96.73%
Thallium	?

Other metals often associated with Copper were tested for and not found, but tests indicated Thallium. This element Thallium occurs in some copper ores in Mexico as the mineral Crookesite, a copper Thallium selenite sulphide; and it is believed the portion unaccounted for in the analysis was due to the Thallium.

[317]

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The little copper bells in the Museum collections seem to have been found in Mexican sites as well as in Central America, and are quite abundant in some localities. Some of these bells were about one half to three-quarters of an inch long, others of more than two inches and of different shape.

13: Phillips U-4 (no date) 1925
NU7 Aztec NU7

S. G. Morley in his description of Copan says:

"The discovery of copper bells of Mexican origin at a number of archeaological sites in Arizona and New Mexico clearly point to trade relations between the Pueblo Indians and the tribes of Central America in pre-Columbian times; these bells very closely resemble the copper bells found in the sacred Cenates of Chichen Itza, Yucatan, which can hardly have been carried there before 1200 A. D.

Analysis has proved these metal bells to be copper with some little impurities; and it is believed they were cast by what is known as the *cire perdue* process. This method consists in using a wax model, or a core of clay covered with a wax pattern, the mould being heated, the wax melted and ran out, leaving the shape of the object to be cast, which was then filled with the melted metal. This is interesting because this process was well known to the makers of bronze ornaments in Europe, and it is a question if these little bells found in the Aztec or Maya burials were made by the *cire perdue* process; was it a discovery by the American race independent of foreign knowledge?

This might suggest a greater antiquity for this art of casting than that in Europe and would show a considerable amount of experience in metallurgy for the aborigines, and it is surprising that more elaborate objects were not made by them. Judging from the character and variety of cast objects of bronze from South America, the ancient Peruvians were familiar with the *cire perdue* method. Did the Inca discover it? They were certainly the earliest users of the alloy bronze in America with the exception of the unknown builders of Tiahuanaco, among whose ruins have been found bronze tools. With regard to the knowledge the Aztecs had of bronze, it is difficult to establish their claim until more analyses are made of specimens of undoubted Mexican origin, indicating an alloy with a composition of about 90% copper and 10% tin. The following analyses by P. Rivet, taken from his contribution in the *Journal de la Société des Américanistes de Paris* show to what extent tin was used by the Aztecs in their metal objects.

13: Phillips U -4 (no date) 1925
NU7 Aztec NU7

●325

Objects from Mexico

Locality	*Object*	*Copper*	*Tin*
Valley of Mexico	Chisel	97.87%	2.13%
Atotonilco	Hatchet	98.05%	1.91%
Tlaxiaco	"	99.61%	0.17%
Tlacolula	"	Copper	No tin
Oaxaca	"	"	"
Mexican	Bell	"	"

Other metal objects of Mexican origin yielded thus:

Currency hatchets	25 samples	All copper	No tin
Knife hatchets	5 "	"	"
Flat hatchets	7 "	"	"
Chisels	8 "	"	"
[411] Hatchets	13 "	3 samples with no tin	
Lance points	7 "	1 " " " "	
Bells	26 "	Copper " "	

Some 28 objects, when analyzed, showed the presence of tin was intentional. Punches, lance points and needles were bronze, while money hatchets, and thin hatchet blades contained no tin. Of 108 samples of metals analyzed, only 38 contained tin. Lance points and chisel hatchets had from 2.13% to 3.4% tin. Two specimens of hatchets contained 9.3% of tin. But it is a question, were they of pre-Columbian origin or made *after* the arrival of the Spaniards?

From the analyses of the Mexican metal objects it is evident that tin was not generally employed for obtaining a hard alloy, which required about 10%. The small amount of tin usually found would rather indicate an accidental impurity in the copper than an intentional ingredient in the alloy.

That the ancient Mexicans or Aztec people were familiar with the metallurgy of gold, silver and copper, the process of hammering, fusing and casting, there is no doubt, and that they understood soldering and even the plating of gold and silver on copper is suggested by the specimens in the museum collections.

The Bronze Age as determined by analyses of the specimens described, is still a matter of doubt for the Aztec, and must

13: Phillips U-4 (no date) 1925
NU7 Aztec NU7
Maya NV4
Middle American Civilization NV1

A 325

remain an open question until it can be decided by finding more specimens of recognized bronze composition, and of undoubted Mexican manufacture of pre-Columbian date.

II

MA 325 MA [439]

The Maya were in the Stone Age in pre-Columbian times, although in the latter part of the Second Empire, they seem to have developed a knowledge of working the precious metals and copper; possibly this was due to the facility of obtaining copper and other metals from the neighboring provinces of Mexico with whom they traded. Copper objects said to be from Central America are not numerous in our museums, and although the old Spanish writers speak of "Bronze" it is doubtful if they knew the chemical composition of that metal and how it differed from Copper. Some metal specimens from Central America have been analysed. Small bells, needles and figurines from Chiriqui proved to be copper with no tin. Some bells contained 80% of Copper and 20% of gold. Of course none of these were Bronze. Some little bells from Bolivia and Argentina analysed Copper 99.35% and Tin 0.65%. The tin doubtless was an impurity in the Copper.

Mi 325 171

Mi MA 325 171

Another metal object said to be found in Central America is a T-shaped implement like those common in Mexico. A specimen said to be of Maya origin from the Peabody Museum, Cambridge, when analysed, proved to be simply *Copper*. A small copper bell from Yucatan upon analysis gave;

Copper	97.00%
Tin	.34%
Lead	1.00
Iron	.07%
	98.41%

A small bell from a cenote at Chichen Itza, Yucatan, yielded:[1]

Copper	98.44%
Iron	0.78%
Nickel	trace
	99.22%

[1] Analyses made at University of Pennsylvania by Dr. D. L. Wallace.

16:Bandelier E-4 (no date) 1880 NU7 Aztec NU7

463 *compelled* him to do it.[70] It is true, that such as formed gold or silver into pleasing or (as viewed from eastern notions of taste) rather striking shapes, enjoyed some particular consideration; but this was not so much in deference to their skill, as to the *material* upon which they exerted it. Gold ("teo-cuitlatl") and silver ("Iztac-teo-cuitlatl") were regarded as "offal of gods." Thus they became objects of "medicine," and those who wrought them into useful or decorative articles, were near to the "medicine-men" themselves.[71] Furthermore, the manner and method of working was so slow, it relied so exclusively upon that patient [556] disregard of time which characterizes even the manufacture of a simple arrowhead, that no accumulation of wealth could result from it.[72] Besides, the artisan had, like any other member of the kin, to furnish his share towards the requirements of public

[70] *Durán* ("Rapport, etc.," p. 129). "Los chefs inférieurs et les personnes du peuple élevaient aussi leurs enfants avec beaucoup de soin, leur inspiraient l'horreur du vice, leur recommandaient le respect des dieux, les conduisaient aux temples et les faisaient travailler suivant leurs dispositions; cependant, en général, le fils embrassait la profession de son père." *Gomara* ("Conquista, etc.," Vedia, Vol. I, p. 439). "Los padres enseñaban á sus hijos sus oficios, no porque no tuviesen libertad para mostrarlos otro, sino porque los aprendiesen sin gastar con ellos." *Carlos María de Bustamante. Tezcuco en los últimos Tiempos de sus antiguos Reyes*," 1826. Parte tercera, (Cap. III, p. 210). "Enseñaban ademas los oficios á que tenian aficion." *Clavigero* (Lib. VII, [564] cap. V, p. 462). "The sons generally learned the trade of their fathers," but they were not bound to do it, and therefore no "caste."

[71] The words are composed of: "Iztac," white object (*Molina* II, p. 49). "Teotl" god (II, p. 101), "Cuitlatl" filth, therefore gold was "offal of God," and silver, "white offal of God."

325 [72] The working of gold and silver was regarded, by the Mexicans, as an invention of "Quetzalcohuatl." *Sahagun* (Lib. III, cap. III, p. 246). "y los vasallos que tenia eran todos oficiales de artes mecánicas, y diestros para labrar las piedras verdes, que se llaman chalchivites, y tambien para fundir plata, y hácer otras cosas; y estas artes todos tuvieron principio y origen de l dicho *Quetzalcoatl*." (Also Lib. X, cap. XXIX, [585] p. 113, etc.). Theft of gold or precious stones was punished by death through sacrifice. *Clavigero* (Lib. VII, cap. XVII, p. 467). *Fetancurt* (Parte IIa, Trat. I°, p. 68. "Leyes de los Mexicanos").

287 [73] A very remarkable way of manufacturing their most admired works — those made of feathers — is reported by *Mendieta* (Lib. IV, cap. XII, pp. 405 and 406): "And there is, besides, something else to notice of this featherwork, namely: that if there are twenty artisans, they will undertake jointly the manufacture of one piece ("imágen"), for, dividing among themselves the figure of the image in as many parts as there are of their number, each one takes his piece home and finishes it there. Afterwards they all meet again and put their pieces together, thus finishing the figure in as perfect a manner as if one alone had made the whole." (Copied by *Torquemada*, Lib. XIII, cap. XXXIV, p. 489, and, with slight variations, also by *Fetancurt*, Vol. I, p. 389.) In regard to the manner of working, *Torquemada* (Lib. XIII, cap. XXXIV, p. 487), makes the pertinent remark: "All this they worked (as we have said) with other stones, and with flint; and according to the subtlety of the work, I think they must have spent long time in finishing it." See . . general *E. B. Tylor* ("*Researches into the Early History of Mankind*," Cap. VII, pp. 187 and 188), also *Motolinía* (Trat. I, cap. IV, pp. 31 and 34).

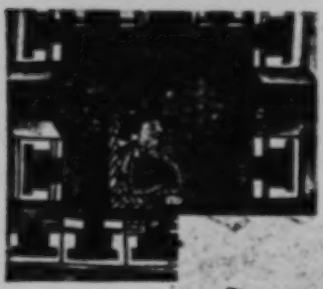
326

326 SMITHS AND THEIR CRAFTS--nonindustrialized specialization in metallurgical crafts; types of specialists (e.g., blacksmiths, coppersmiths, tinsmiths, silversmiths, goldsmiths, gunsmiths); special skills and services of each; products not elsewhere described; organization (e.g., guilds); social status of smiths; etc. See also:

Tools, weapons, utensils, and appliances . . . 41
Jewelers 306
Industrial specialization in metallurgical processes 257, 269

1:Vaillant A-5 (1928-1936)1941 NU7 Aztec NU7

531



Rich Man

[482]

Poor Man

Beggar Man

[735]

Goldsmith

[326]

Thief

[685]

Feather Worker

[286]

Warriors

[701
411
714]

PLATES 34-35

AZTEC SOCIETY AND COSTUME FROM

During the mid-sixteenth century the Spanish friar Bernardino de Sahagun made a famous study of the Aztecs, *Historia General de Nueva España*, which was not published until 1829. He had the Indians prepare copious illustrations to clarify his text, but they did not reach public circulation until 1905. The selections here show, besides the social division

[p. 112(B)]

1:Vaillant A-5 (1928-1936)1941 NU7 Astec NU7

326
301
532

PLATE 46

AZTEC GOLDWORK

TOP ROW: Small gold ornaments from Oaxaca reveal exquisite workmanship. MIDDLE: A buckle representing the god Xipe has a strong sculptural quality. BOTTOM: *Left:* A gold worker from the Codex Florentino makes a mosaic ornament like that at right, in which turquoise mosaic enhances a gold reproduction of the shield and arrows, constituting the sign for war.

[P. 144 (B)]

1:Vaillant A-5 (1928-1936)1941 NU7 Aztec NU7

301
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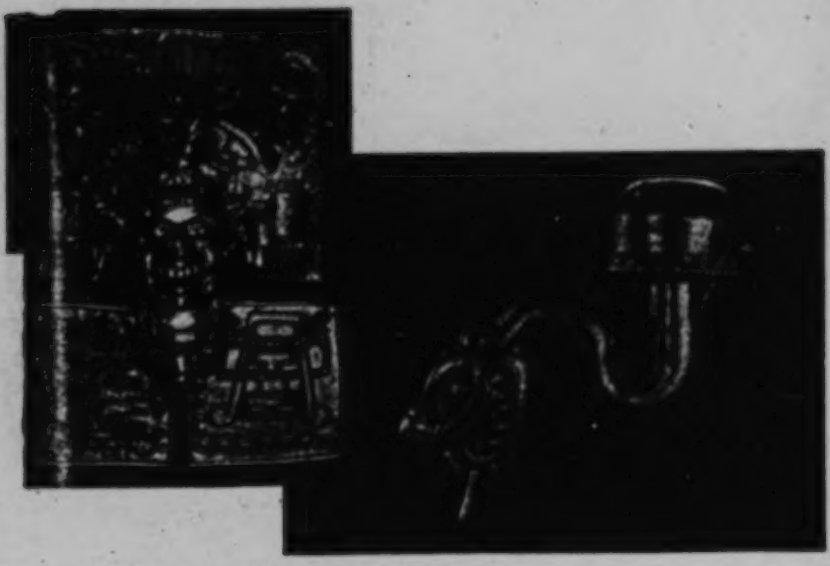
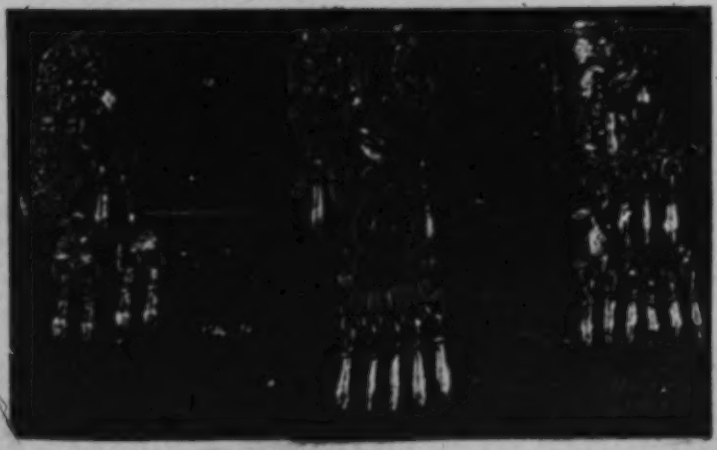


PLATE 47

AZTEC GOLDWORK

Almost all Aztec goldwork went into the Spanish melting pot. Most surviving examples come from Oaxaca, where the supply was doubled by Cano's discovery of Tomb 7 at Monte Alban, represented by upper left and bottom and opposite-page middle. The lip ornament (*upper right*) has a movable tongue that makes a very lively serpent indeed. These few examples give an idea of the range of form and skill of the Aztec goldsmith.



[p. 144(c)]

1:Vaillant A-5 (1928-1936)1941 NU7 Aztec NU7

ing of the arm thereby giving the missile an increased propulsive force. Some of these *atl-atls* were most delicately carved and represent the best of Aztec design. (See Plate 54, bottom.)

Metallurgy was in its infancy. Copper was cold-hammered; the art of adding alloys to make bronze had not reached Mexico from the south, but the gilding of copper and mixing of gold and copper were adopted by Mexican goldsmiths. Copper was cast into bells and ornaments, and the process, used also for gold, was the cire-perdue, or lost-wax, method. The desired shape was modeled in clay, over which was dusted finely ground charcoal, followed by an even layer of wax. This coating was also dusted with charcoal and the whole enclosed in clay, which was perforated at the top and bottom. The molten metal was poured in at the upper hole after the wax was melted and the lower orifice plugged. When the metal cooled the cast was broken and the finished object removed.[11] (See Plates 46–47.)

Although most of the native goldwork found its way to the Spanish melting pot, a few lovely ornaments survived; in 1932 the quantity was more than doubled by Dr Alfonso Caso's discovery of the undisturbed tomb of a high Mixtec official. The design and shape of these necklaces, earplugs and rings, by their sheer intricacy and bulk, make one realize that the Spanish descriptions of Cortes' loot understated the rich ability of the Aztec goldsmiths.[12]

Metalworking, without much question, had its origin in Ecuador or Peru, and various techniques were transmitted up the Pacific coast to Panama and Costa Rica, where important goldworking industries were founded. Although the intervening area produced little metal, another center was

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632 Teotihuacan gave quarterly tribute of thick henequen mantles called
651 "ichtilmatl" and maguey leaves for fuel.[80] However, the *Tratado del principado ... de San Juan Teotihuacan*[81] gives much ampler detail.

Tepechpa preserved the memory, in 1580, of various stages in its evolution as a tributary. At first its people paid their cacique products of the chase, then mantles of various sorts, and finally, *circa* 1450, a quarterly tribute of cotton mantles (fifty mantles, four *piernas* wide and eight *braças* long; thirty-four *braças* long and four *piernas* wide; and forty more of *tochomitl* style) as well as twenty loads of cacao
[262] of Xoconochco (2,400 beans to the load), twenty loads of chile, and twenty of little peppers.[82]

● [326] Tepetlaoztoc, as we see from the handsome *Codex Kingsborough*, gave rich articles of goldwork to its first colonial overlords—obviously a continuation of a long tradition.

Tetlyztaca paid henequen mantles "because they are poor people."[83]

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se llamava ahuitzotzin quiere decir nutria este fue el que mandó que tributasen mantas y mahiz y gallinas para hacer una fiesta quando acabó el templo del ydolo que llamauan huitzilopochtli desde entonces començaron los tributos deste pueblo y toda la comarca." Cf. n. 81 above for a similar case.

[80] *PNE*, 6: 221: "cada ochenta dias: algunas mantas de nequen gruesas que llaman ichtilmates y algunas cargas de pencas de maguey de esas que llaman metloni."

[81] Guzmán, "Un manuscrito de la colección Boturini ...," *Ethnos* (Stockholm, 1938), 3: 94.

[82] *PNE*, 6: 234: "cinquenta años antes del rreynado de Montezuma cada ochenta dias le tributauan cinquenta mantas de algodon de quatro piernas en ancho y ocho braças en largo, y otras treinta mantas de algodon de quatro braças en largo y quatro piernas de ancho, y otras quarenta mantas labrados de tochomytl para bestirse (cf. Atotonilco de Pedraza, p. 40), y beinte cargas de cacao de a beinte e quatro myll cacaos carga, de xoconosco, y quarenta naguas y otros tantos guipiles y beinte cargas de chile y otras tantas de pepitas."

[83] RHE, 1: 152.

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NATURE OF THE PROVINCE

Inhabitants and languages.—The Mendizabal-Jiménez Moreno linguistic map indicates great linguistic complexity for this province: Náhuatl, Mixtec, Tlapanec, and Matlame.

Olinalan, celebrated for its lacquer-work, probably carried on that activity in pre-Hispanic times. From adjacent Tlalcoçauhtitlan Province, perhaps only a few kilometers away, "bateas" went as tribute to Texcoco.[a]

Provincial borders in 1519.—Because half the towns of the province cannot be identified on the maps of unexplored Guerrero, the north of this province is a great blank. It bordered, probably, on Huaxtepec Province in that direction, as on the west with Tlalcoçauhtitlan, on the east with Yoaltepec, and on the south with Tlapan, all of them fellow tributaries.

Regional names.—Somewhere in the dubious northeast began the region known as Totollan.[a]

TRIBUTE

Tribute of the whole province.—Quiauhteopan was a rich mining region, as is shown by the following list of its tribute to the highlands:

CLOTHING

400 large mantles**
1 warrior's costume with shield*

FOOD

100 jars of bee honey*

OTHER GOODS

40 large copper bells**
80 copper axeheads**
1 dish of little turquoises*

Tribute of the component towns.—Olinalan, in the mid-sixteenth century, rendered a sizable quarterly tribute of base gold, cacao, money resulting from the sale of cacao, and sixty little jars of honey (over

[a] See the section on Tlalcoçauhtitlan, above.

[a] *PNE*, 5: 57: "Piaztla ... está en la provincia de los Totoltecas de lengua mexicana diferente de los de la Misteca sujetos a la dotrina de la cabecera de Acatlan." Of the same town, it is said farther on (5: 77): "En este pueblo se habla la lengua mexicana corruta, porque es de la provincia de Totola."

11:Diaz T,H-5 (1519-1520) 1910
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"I know well enough that as soon as you came here you opened the chamber and beheld it all, and that you sealed it up again as it was before. When you send it to him, tell him in your papers and letters, 'This is sent to you by your true vassal Montezuma.' I will also give you some very valuable stones which you will send to him in my name; they are Chalchihuites, and are not to be given to any one else but only to him, your Great Prince. Each stone is worth two loads of gold. I also wish to send him three blow guns with their bags and pellet moulds for they have such good jewelwork on them that he will be pleased to see them, and I also wish to give him of what I possess although it is but little, for all the rest of the gold and jewels that I possessed I have given you from time to time." [411]

When Cortés and all of us heard this we stood amazed at the great goodness and liberality of the Great Montezuma, and with much reverence we all doffed our helmets, and returned him our thanks, and with words of the greatest affection Cortés promised him that he would write to His Majesty of the magnificence and liberality of this gift of gold which he gave us in his own royal name. After some more polite conversation Montezuma at once sent his Mayordomos to hand over all the treasure and gold and wealth that was in that plastered chamber, and in looking it over and taking off all the embroidery with which it was set, we were occupied for three days, and to assist us in undoing it and taking it to pieces, there came Montezuma's goldsmiths from the town named Azcapotzalco,[1] and I say that there was so much, that after it was taken to pieces there were three heaps of gold, and they weighed more than six hundred thousand pesos, as I shall tell further on, without the silver and many other rich [326]

[1] Escapuçalco in the text.

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things, and not counting in this the ingots and slabs of gold, and the gold in grains from the mines. We began to melt it down with the help of the Indian goldsmiths, who were, as I have said, natives of Azcapotzalco and they made broad bars of it, each bar measuring three fingers of the hand across. When it was already melted and made into bars, they brought another present separately which the Grand Montezuma had said that he would give, and it was a wonderful thing to behold the wealth of gold and the richness of the other jewels that were brought, for some of the Chalchihuites were so fine that among these Caciques they were worth a vast quantity of gold. The three blow guns with their pellet moulds, and their coverings of jewels and pearls, and pictures in feathers of little birds covered with pearlshell and other birds, all were of great value. I will not speak of the plumes and feathers and other rich things for I shall never finish calling them to mind.

Let me say that all the gold I have spoken about was marked with an iron stamp, which had been made by order of Cortés and the King's Officers, who had been appointed by Cortés with the consent of all of us and in the name of His Majesty until he should give other instructions. At that time these were Gonzalo Mejía, who was treasurer, and Alonzo Dávila who was accountant, and the stamp was the royal arms like those on a real[1] and the size of a testoon.[2] The mark was not put on the rich jewels which it did not seem to us should be taken to pieces.

For weighing all these bars of gold and silver, and the jewels which were not taken to pieces, we had neither marked weights nor scales, and it seemed to Cortés and to

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[1] Real, a small silver coin.

[2] "Toston de a quatro," a half peso = four reals.